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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,343	02/06/2004	Paul R. Sharps	1613370-0046 CON	6467

7590 09/20/2006

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EXAMINER	
DIAMOND, ALAN D	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/773,343	SHARPS ET AL.	
	Examiner	Art Unit	
	Alan Diamond	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *37-73 and 86-111* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *37-73 and 86-111* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Comments

1. The 35 USC 112, second paragraph, rejection of claim 50 with respect to the term "the subcell" has been overcome by Applicant's amendment of the claim.

2. The obviousness-type and provisional obviousness-type double patenting rejections have been overcome by the terminal disclaimers filed June 27, 2006.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 37-49, 49-73, and 86-111 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 37, at line 6, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 38-46.

In claim 45, at line 2, the "at least in part" range for the InGaP is not supported by the specification, as originally filed.

In claim 46, at line 2, the "at least in part" range for the GaAs is not supported by the specification, as originally filed.

In claim 47, at lines 11-12, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 48 and 49.

In claim 49, bridging lines 2 and 3, the term "at least one of the solar cell is fabricated at least in part with GaAs" is not supported by the specification, as originally filed.

In claim 50, at line 12, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 51-64.

In claim 52, bridging lines 2 and 3, the term "at least one of the solar cell is fabricated at least in part with GaAs" is not supported by the specification, as originally filed.

In claim 65, at lines 15-16, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 66-73.

In claim 86, at line 15, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 87-89.

In claim 90, the requirement that the top layer of the top cell has a first polarity and the bottom layer of the bypass diode has said first polarity is not supported by the specification, as originally filed. The same applies to dependent claims 91 and 92.

In claim 90, at line 9, the range of "at least one layer" for the bypass diode is not supported by the specification, as originally filed. The same applies to dependent claims 91 and 92.

In claim 90, at lines 13-14, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 91 and 92.

In claim 92, at line 2, the "at least in part" range for the GaAs is not supported by the specification, as originally filed.

In claim 93, at lines 14-15, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 94-99.

In claim 100, at lines 16-17, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 101-106.

In claim 107, at lines 16-17, the "substantially the same composition and thickness" limitation is not supported by the specification, as originally filed. The same applies to dependent claims 108-111.

Applicant cites the Rule 1.132 Declaration of Paul R. Sharps (Sharps Declaration) and argues that in a chemical vapor deposition process of the type described in the instant application, layer thicknesses are not the same because of variations caused by the deposition process. However, this argument is not deemed to persuasive because the word "substantially" is never used in the originally filed

disclosure to describe any part of the invention. The word "substantially" introduces a "fudge factor" that opens up whatever it is modifying to interpretation. Such interpretation is not supported by the original disclosure. If Applicant had wanted to introduce a fudge factor because things aren't perfect, it should have been done when the application was originally filed.

Applicant argues that the range "at least in part" in claim 46, as well as claims 49 and 52, is supported by Figure 1, where "the buffer layer of the bottom cell is shown as GaAs." However, this argument is not deemed to be persuasive because claim 46 recites "wherein the first solar subcell is fabricated at least in part with GaAs". In Figure 1, the Ge cell (104) has no GaAs. The GaAs buffer layers of the GaAs buffer (103) is not part of any of the subcells in the Figure 1. The middle subcell has three GaAs layers and an InGaP window layer. The upper subcell has a GaAs window layer. The range "at least in part" in claim 46 has the upper limit that the entire first solar subcell is fabricated from GaAs. The originally filed disclosure does not support an entire first solar subcell fabricated from GaAs. Even if the first solar cell referred to in claim 46 refers to the solar cell 103 in instant Figure 1, neither said Figure 1 nor the rest of the instant disclosure provides support for an entire first solar subcell fabricated from GaAs as now encompassed by instant claims 46, 49, and 52.

With respect to claim 90, Applicant argues that, with reference to Figure 8, the top layer of the top cell is n-type window layer 846, and that the bottom layer of the bypass diode is n-type layer 860, and that therefore, the bottom layer of the bypass diode and the top layer of the top cell have a first polarity. However, this argument is

not deemed to be persuasive because, while n-type is and example of a polarity, it is not sufficient support for all possible polarity types. The issue here is that the species, i.e., n-type, does not support the genus, i.e., polarity.

With respect to the phrase "at least one layer" in claim 90, Applicant argues that in instant Figure 8, bypass diode 620 comprises elements 860, 862, and 864, and that each of elements 860, 862, and 864 comprises a layer. However, this argument is not deemed to be persuasive because the range "at least one layer" has an infinite number of layers as an upper limit. The showing in said Figure 8 does not support an infinite number of layers.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 37-49, 50-73, 86-89, and 93-111 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 37, at line 6, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 38-46.

In claim 47, at lines 11-12, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 48 and 49.

In claim 50, at line 12, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 51-64.

In claim 65, at lines 15-16, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 66-73.

In claim 86, at line 15, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 87-89.

In claim 90, at lines 13-14, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 91 and 92.

In claim 93, at lines 14-15, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 94-99.

In claim 100, at lines 16-17, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 101-106.

In claim 107, at lines 16-17, it is not clear what is to be encompassed by the term "substantially the same composition and thickness". The same applies to dependent claims 108-111.

Applicant argues that the term "substantially the same thickness" refers to the fact that each layer in the sequence of semiconductor layers in the bypass device and have the same composition and thickness as the corresponding layer in the subcell. Applicant's argument is not deemed to be persuasive because it is not clear how close to having the same thickness the corresponding layers must have in order to be considered to have "substantially the same thickness".

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 47-49, 90-93, 95-98, 107, and 110 are rejected under 35 U.S.C. 102(e) as being anticipated by Boutros et al, U.S. Patent 6,635,507.

As seen in Figure 8, and with respect to independent claims 93 and 107, Boutros et al teaches a multijunction solar cell comprising a Ge substrate (802); a first region including the N and P GaAs layers (804) which form a first junction of the multijunction solar cell and the N and P GaInP layers (806) which form a second junction of the multijunction solar cell, wherein this first region includes the portion of said N and P GaAs layers (804) and the portion of the N and P GaInP layers (806) not directly below,

but to the right of the GaAs cap layer. In a second region, the portions of corresponding N and P GaAs layers (804) and N and P GaInP layers (806) directly below the GaAs Cap support the bypass diode (810) to protect the cell against reverse biasing (see also col. 1, lines 16-22; and col. 7, lines 47-65). With respect to claims 47 and 90, these claims require that the top layer of the top cell has a first polarity and that the bottom layer of the bypass diode has the first polarity. In Figure 8, it is the Examiner's position that the GaAs N^{++} layer can be considered to by the lower layer of the bypass diode, and thus, has the same polarity as the upper N-type GaInP layer of the upper solar cell. Indeed, as seen in Boutros et al's Figures 2A, 3A, and 4A, the bottom layer of the bypass diode (210, 310, 410) is N^{++} and is the same polarity, i.e., N-type, as the top layer (208, 308, 408) of the solar cell. With respect to claims 97 and 107, when the GaAs P^{++} layer is considered the lateral conduction layer (as per instant claims 96 and 110), then the bypass diode above it reads on the instant etch stop layer. Alternatively, with respect to claim 97 and 107 when the GaAs Cap N^{++} layer is considered the lateral conduction layer, then the GaAs P^{++} layer reads on the instant etch stop layer.

With respect to claim 98, and as clearly seen in said Figure 8, the Ge substrate (802) forms an electrical connection path between the multijunction solar cell and the bypass diode.

In an alternative with respect to claim 107, the N and P GaAs layers (804) and N and P GaInP layers (806) encompass the instant first region, and the bypass diode (810) encompasses the instant second sequence of layers.

Since Boutros et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

9. Claims 47, 48, 65, 66, 68, 69, 86, 87, 89-91, 93, 95, 97-101, 103, 104, and 106-108 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 9-64397, herein referred to as JP '397.

JP '397's solar module in Figure 2 comprises a conductive substrate (203); a multijunction solar cell (201) having first (204A, 205A, 206A) and second (204B, 205B, 206B) subcells formed on a first portion of the substrate; bypass diode (202) formed on a second portion of the substrate (203) having p-type, i-type and n-type layers (205A, 204B, 207D); and metal contact layers (208, 208D) (see also paragraphs 0031 to 0045). As seen in Figure 2, the bypass diode (202) is clearly integral with and laterally spaced apart from both the first and second subcells. With respect to the limitation in claim 37 that the bypass device and the subcell have identical sequences of layers with substantially the same thickness and form an integral semiconductor body, it is seen that JP '397's multijunction solar cell solar cell in Figure 1 has transparent electrode (107) followed by collection electrode (108). This is the same sequence as in the bypass diode, which has transparent electrode (107D) followed by collection electrode (108D). JP '397's multijunction solar cell and bypass diode form an integral semiconductor body on the substrate (103). With respect to independent claims 47 and 90, the top layer (104A) of the top cell in Figure 1 can be p-type, and the bottom layer (104D) of the bypass diode can also be p-type (see paragraphs 0033, 0034, and Example 2 where a pinpin structure is used for the multijunction solar cell, i.e., layer

104A is p-type, and the bypass diode is ip structure, i.e., layer 104D is p-type). With respect to claim 93, JP '297's conductive substrate (103) in Figure 1 reads on the instant planar lateral conduction layer. With respect to claim 100, JP '397's Figures 1 and 2 anticipate this claim because a "corresponding" sequence encompasses the situation in these figures. In particular, each layer in the bypass diode has a "corresponding" layer in the multijunction solar cell in said figures. With respect to claim 107, as seen in JP '397's Figure 3, there is a substrate (303) that has a sequence of semiconductor layers, the lower portion of the sequence, i.e., layers (304A) to (306B) that forms the multijunction solar cell, and the upper portion of the sequence, i.e., layers (350D, 304D) that forms the bypass diode. In said Figure 2, conductive layer 308 reads on the instant highly conductive layer.

With respect to claims 48 and 91, as clearly seen in Figure 2, the sequence of layers of the subcells and the sequence of layers of the bypass diode would clearly be grown in the same process step.

With respect to claims 65, 86, 99, and 108, the metal lead wire (209,309) together with the metal contact (208D,308D) read on the instant metal contact.

With respect to claims 66, 93, 100, and 107, the substrate (303) is also a lateral conduction layer. With respect to claim 95 and in the alternative, the lateral conduction layer can be considered to be semiconductor layer (304A), which is doped either n-type or p-type (see paragraph 0025).

With respect to claim 68 and 97, any of the layers (304A to 307) above the substrate (303), or any of the layers (305A to 307) above layer (304A) reads on the instant stop etch layer.

With respect to claim 89, as clearly seen in Figure 3, the sequence of layers of the subcells and the sequence of layers of the bypass diode would clearly be grown in a different, subsequent process step.

Since JP '397 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

10. Claims 47-57, 59, 61, 65-68, 70, and 86-111 are rejected under 35 U.S.C. 102(b) as being anticipated by Ho et al, WO 99/62125. In particular, see Figures 12 and 14B, and page 8, lines 16-23, which teach the claimed invention.

Ho et al's multijunction solar cell has a first portion at the left having a first GaAs subcell (1412-1416) and a second GaInP subcell (1422-1426); and a second portion laterally spaced apart from the first portion by a trough and including bypass diode (1410) that is integral with said first subcell (see Figure 14B; and page 8, lines 18-23). The diode (1410) includes a metal/semiconductor contact comprising front metal contact (1440), which, it is the Examiner's position, forms a Schottky junction with the tunnel diode layer N^{++}. The solar cell has a Ge substrate (1402-1404) (see Figure 14B). The combination of Ho et al's metal contact (1436) and front metal contact (1440) reads on the instant metal layer. The tunnel diode layers (1418) and (1420) in both said first and second portions in said Figure 14B read on the instant lateral conduction layer. As seen in Ho et al's 14B, the topmost layer of the topmost cell is n-type Ge substrate

(1402) which is of the same polarity as the bottom n^{++} tunnel diode layer (1420) of the bypass diode (1410). With respect to claim 50, the bypass diode and the GaAs subcell have the same sequence of layers and the same composition and thickness, as seen in said Figure 14B. With respect to claim 86, said Figure 14B clearly has first and second portions, the first portion having the solar cells, and the second portion having the overlying bypass diode (1410). With respect to claim 93, the front metal contact (1440) in said Figure 14B reads on the instant planar lateral conduction layer. With respect to claim 100, as seen in said Figure 14B, front metal (1436) is a lateral conduction layer that is physically separated from front metal (1440), which is another lateral conduction layer. With respect to claim 107, see Ho et al's Figure 12, where there is a cascade solar cell at a lower portion, a bypass diode (1214, 1216) at an upper portion, GaAs connecting layer (1210) which reads on the instant highly conductive lateral conduction layer, and layer (1222) which corresponds to the metal layer in instant claim 108 (see also page 7, line 16). The solar cell can be multijunction (see page 5, lines 15-20). Since Ho et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 47-68, 70, and 86-111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boutros et al (U.S. Patent 6,635,507) in view of Ho et al (WO 99/62125).

As seen in Figure 8, and with respect to independent claims 47, 65, 86, 90, 93 and 107, Boutros et al teaches a multijunction solar cell comprising a Ge substrate (802); a first region including the N and P GaAs layers (804) which form a first junction of the multijunction solar cell and the N and P GaInP layers (806) which form a second junction of the multijunction solar cell, wherein this first region includes the portion of said N and P GaAs layers (804) and the portion of the N and P GaInP layers (806) not directly below, but to the right of the GaAs cap layer. In a second region, the portions of corresponding N and P GaAs layers (804) and N and P GaInP layers (806) directly below the GaAs Cap support the bypass diode (810) to protect the cell against reverse biasing (see also col. 1, lines 16-22; and col. 7, lines 47-65). Said first and second regions in said Figure 8 clearly are laterally spaced apart, as in claims 47 and 90. With respect to claims 66, 68, 70, 97, 107, when the GaAs P^{++} layer is considered the lateral conduction layer, then the bypass diode above it reads on the instant etch stop layer. Alternatively, with respect to claims 97 and 107 when the GaAs Cap N^{++} layer is considered the lateral conduction layer, then the GaAs P^{++} layer reads on the instant etch stop layer. As seen in Figure 8, there is a connecting electrical contact (816) deposited on a portion of the substrate (802) and over a portion of the bypass diode (i.e., over a portion of the second region). Clearly, this electrical contact is for shorting

the multijunction solar cell (in both regions) and to electrically connect to said bypass diode in the second region.

With respect to claims 47 and 90, these claims require that the top layer of the top cell has a first polarity and that the bottom layer of the bypass diode has the first polarity. In Figure 8, it is the Examiner's position that the GaAs N^{++} layer can be considered to by the lower layer of the bypass diode, and thus, has the same polarity as the upper N-type GaInP layer of the upper solar cell. Indeed, as seen in Boutros et al's Figures 2A, 3A, and 4A, the bottom layer of the bypass diode (210, 310, 410) is N^{++} and is the same polarity, i.e., N-type, as the top layer (208, 308, 408) of the solar cell.

With respect to claims 48 and 91, when Boutros et al's sequential deposition steps (col. 8, lines 4-46) are considered a growth step, then the layers of the multijunction solar cell and bypass diode are grow sequentially in the same process step, i.e., the process step is the sequential growth of the layers. After the growth step, there is etching (see col. 8, lines 37-46).

With respect to claim 89, and in an alternative with respect to the immediately preceding, the first and second solar cells (804,806) can be considered to be grown in a first process, and then the bypass diode (810) can be considered to be grown in a second process after the first process.

With respect to claim 88, there is a trough between Boutros et al's bypass (810) and the contact (818), and thus, there is a trough between first and second portions as here claimed.

With respect to claims 93, 94, 100, and 109, Boutros et al's contact (818) reads on the instant planar lateral conduction layer deposited over the sequence of layers in the second region. The uppermost GaAs cap of the bypass diode reads on the lateral conduction layer in the first region that is separated from the lateral conduction layer in the first region.

With respect to claim 98, and as clearly seen in said Figure 8, the Ge substrate (802) forms an electrical connection path between the multijunction solar cell and the bypass diode.

Boutros et al teaches the limitations of the instant claims other than the difference which is discussed below

With respect to claims 65 and 86 (and their dependent claims), and also with respect to claims 99 and 108, Boutros et al does not specifically teach that said connecting contact (816) can be made from metal (i.e., instant metal layer). However, as shown by reference sign (1436) in Figure 14B of Ho et al, it is well-known and conventional in the solar cell art to form connecting solar cell contacts from metal (see also page 8, lines 18-23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Boutros et al's connecting contact (816) from metal because it is well-known and conventional in the art to do so, as shown by Ho et al.

Response to Arguments

13. Applicant's arguments filed June 27, 2006 have been fully considered but they are not persuasive.

Applicant argues that the integral bypass diode in Boutros et al protects an adjacent semiconductor cell, not the same cell on which the bypass diode is integrated, and cites col. 6, line 56 to col. 7, line 12, and Figure 5 of Boutros et al. Applicant argues that "if there was not an array of cells, but only one solar cell, the bypass diode of Boutros et al would not be connected to that solar cell, and thus, the bypass diode disclosed in Boutros [et al] would not function to protect the sole solar cell." However, this argument is not deemed to be persuasive because it is Figure 8 of Boutros et al, not Figure 5 or Figure 5's discussion at col. 6, line 56 to col. 7, line 12, that is pertinent to the instant claims. In Figure 8, the bypass diode (810) protects cells (804) and (806) that are integrated beneath it. There is also clearly illustrated in Figure 9, which is a schematic of the structure in Figure 8. Indeed, Boutros et al teaches that "bypass diode **810** is connected in an anti-parallel configuration with the series connection of cells **804** and **806**" (see the sentence bridging cols. 7 and 8).

Applicant argues that the specification is not clear on the point that Boutros et al's Figure 9 is a schematic of its Figure 8. However, this argument is not well taken because Boutros et al, at col. 3, lines 7-8, clearly states "Fig. 9 illustrates a schematic for the structure described in Fig. 8".

Applicant argues that element 808 in Boutros et al's Figure 8 is an isolation layer, and that Figures 2A, 3A, and 4A merely show an abstracted view of the idea of the Boutros et al invention, but that the actual Boutros et al invention is shown in Figure 8. However, this argument is not deemed to be persuasive because it is the Examiner's position that the GaAs N^{++} layer can be considered to by the lower layer of the bypass

diode, and thus, has the same polarity as the upper N-type GaInP layer of the upper solar cell. The GaAs N^{++} layer is in direct contact with the bottom of Boutros et al's bypass diode and thus, can be considered part of it in the layered structure of Figure 8A. There is no patentability when the prior art shows the same layer in the same place but calls it a different name. Furthermore, 2A, 3A, and 4A are more than an abstracted view of the idea of the Boutros et al invention. Indeed, Boutros et al refers to these figures as a "device in accordance with the present invention" and an alternative embodiment of the solar cell assembly of Boutros et al's invention (see col. 2, lines 57-63).

Applicant argues that col. 6, line 56, and Figure 5 of Boutros et al state and show that the bypass diode of Boutros et al is connected to the adjacent solar cell. However, this argument is not deemed to be persuasive because Boutros et al's Figure 8 clearly shows that Ge substrate (802) forms an electrical connection path between the multijunction solar cell and the bypass diode.

The Examiner maintains all the rejections set forth above.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
September 16, 2006